ECS 203 2014: Quiz 1 Solution

Instructions

i. Separate into groups of no more than three persons.

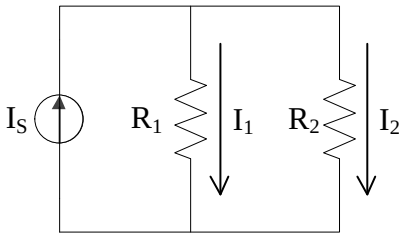
ii. Only one submission is needed for each group. Late submission will not be accepted.

iii. ***Write down all the steps*** that you have done to obtain your answers. You may not get full credit even when your answer is correct without showing how you get your answer.

iv. **Do not panic.**

Name	ID
Prapon	

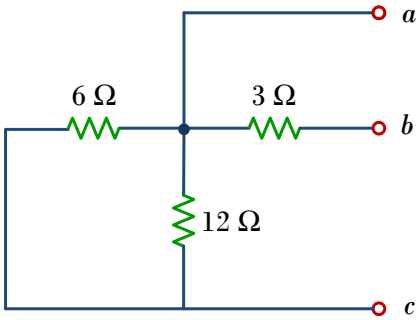
1. Find I_1 when I_S = 10 A, R_1 = 3 kΩ and R_2 = 2 kΩ.



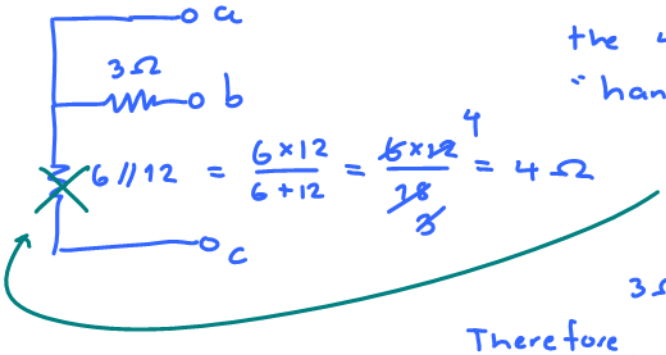
current divider formula

$$I_1 = \frac{\frac{1}{R_1}}{\frac{1}{R_1}+\frac{1}{R_2}} I_s = \frac{R_2}{R_1+R_2} I_s = \frac{2k}{3k+2k} \times 10 = \frac{2}{5} \times 10 = 4\ A$$

2. Consider the circuit below.

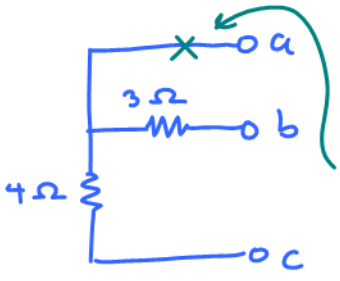


a. Find the equivalent resistance with respect to terminals a-b



wrt. terminals a-b, the 4Ω is a "hanging" branch. So, we can ignore it. Then, only the 3Ω resistor is left. Therefore, R_{eq} = 3Ω.

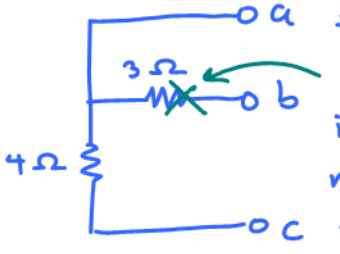
b. Find the equivalent resistance with respect to terminals b-c



wrt. terminals b-c, the connection to a is simply a "hanging" line.

(If we put a current source across terminals b-c, there won't be any current going up to "a" because there is no where the current can go after that)

c. Find the equivalent resistance with respect to terminals a-c

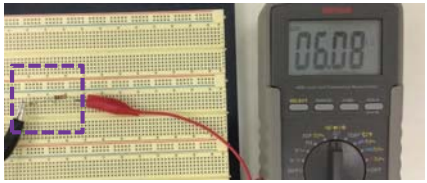


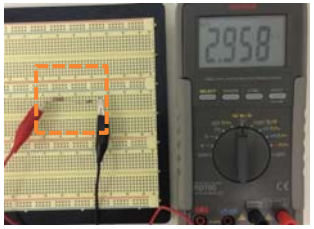
wrt. terminals a-c, the 3Ω is a "hanging" branch. So, we can ignore it. Then, only the 4Ω resistor is left. Therefore, R_{eq} = 4Ω

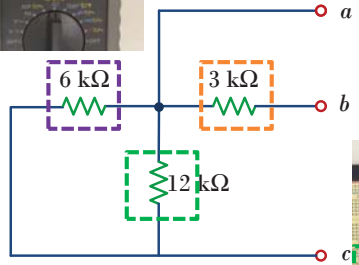
So, 3Ω and 4Ω are actually in series and

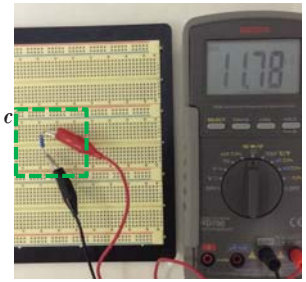
R_{eq} = 3 + 4 = 7Ω

Quiz 1





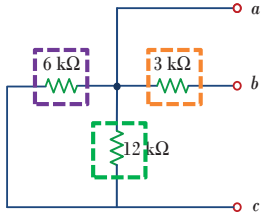


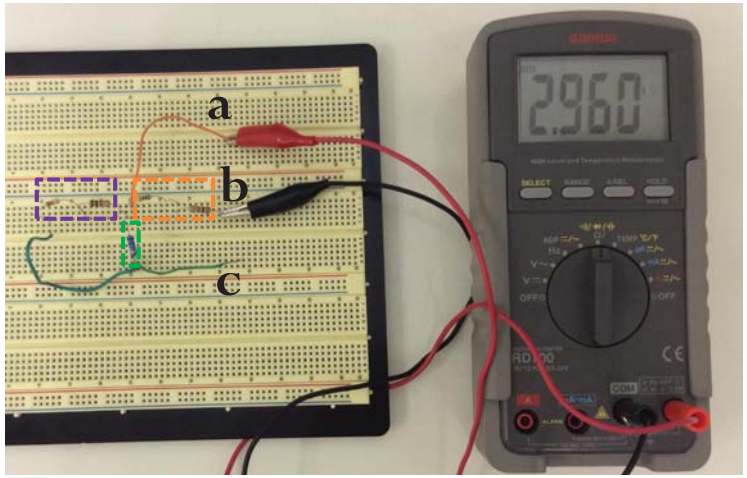


Note that kΩ is used instead of Ω.
(too small)

Quiz 1 Solution

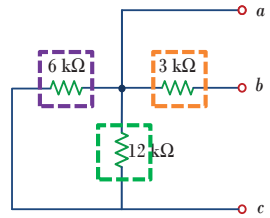
$R_{ab} \approx 3\ \text{k}\Omega$

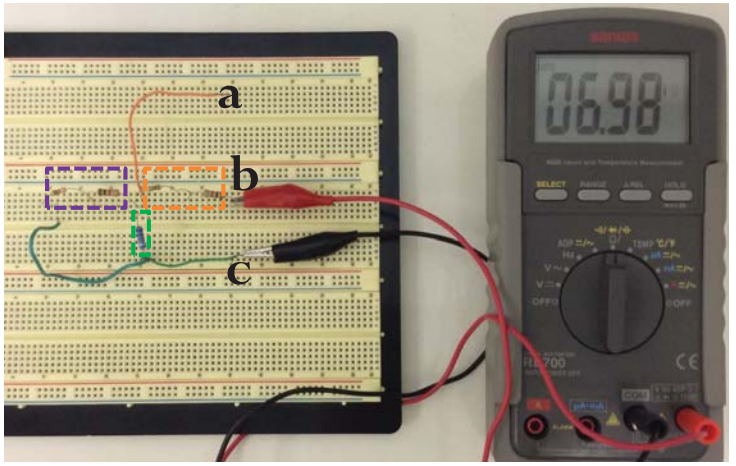




Quiz 1 Solution

$R_{bc} \approx 7\ \text{k}\Omega$





Quiz 1 Solution

$R_{ac} \approx 4\ \text{k}\Omega$